



# LANCASTER LABORATORIES, INC.

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## Agricultural Products Research, Development and Testing

December 20, 1968

Mr. Robert Gawthrop, Jr.  
Attorney-at-Law  
Gawthrop and Greenwood  
119 North High Street  
West Chester, Penna. 19380

Dear Mr. Gawthrop:

Re: Our Sample #G-571

The analysis of the West Caln Township lagoon material on the property of Mr. Dick, submitted November 11, 1968, has been completed and the results are presented in this letter. Section I will contain the chemical data and the biological results will be presented under Section II.

### I Chemical Characterization of Sample

The chemical analyses run on the sample were the same as were outlined in our report dated August 12, 1966 and performed again in July, 1967. The results are listed in the following table.

Table I

<u>Test</u>	<u>Value</u>
pH	7.4
Acidity*	4.3
Total Solids**	7510
Total Inorganic Solids	1480
Total Organic Solids (by difference)	6030

The following interpretations can be drawn from the above results. The composition of the lagoon has definitely changed. The pH has gone from 6.0 in 1967 to a pH of 7.4. The "acidity value" has also increased, even though the pH is higher, the titration has increased due to a greater buffering capacity of the waste. The change in composition of the lagoon material has also been indicated by the solids data. In 1967 the solids were mainly inorganic. The sample submitted by you on November 11, 1968 contained solids

\* Expressed as m.m. of sodium hydroxide required to bring 1 liter of sample to the phenolphthalein end point (pH 8.6)

\*\* All values in remainder of table expressed as parts per million (ppm)

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Mr. Robert Gawthrop, Jr.

primarily organic in nature.

## II Biological Results

The biological evaluations were performed in accordance with procedures outlined in our report of August 12, 1966.

A. Standard Plate Count (Microbic Toxicity) - The material as submitted on November 11, 1968 showed a plate count of 2,9000,000 per ml. This would indicate that there was very little, if any, material present which would have a microbial toxicity.

B. Mouse Toxicity Test - Into each of two pens were placed three mice. The mice were allowed to condition for a period of three days. On the third day the water supply to the one pen was replaced with a 10% solution of the lagoon waste. After two weeks, there was no indication that the material at a 10% concentration was harmful. The control mice and the experimental mice were all alive and functioning normally. The mice on the test material did show a reduced consumption of liquid.

C. Fish Toxicity Test - Three guppies (1 male and 2 females) were placed into each of five fish bowls which contained 1500 ml of water which had been conditioned for four days. The fish were allowed to condition for an additional four days. After the four days portions of lagoon waste were added to the bowls so as to provide concentrations of 0, 10, 100, 1000, and 10,000 ppm. The experiment went for two weeks with daily checks.

During the test some fish deaths occurred in all bowls, including the control. This would indicate that there may have been an environmental or genetic factor involved. Nevertheless, it can be concluded that no substance was contained in the lagoon waste which was highly toxic, because some fish lived at all concentrations.

## III Summary-Conclusions

Chemical analyses of the recent lagoon sample show distinct changes in overall lagoon composition since 1967. A rise in pH is noted, along with a greater buffering capacity of the waste. The total solids content has risen somewhat, and its organic-inorganic ratio has shifted significantly.

Biologically, no evidence of toxicity was noted. The material had a high viable bacteria count as received. As for the mice and guppy test, no indications of toxicity were noted.

Sincerely yours,

*C. Robert Graham*  
C. Robert Graham  
Microbiologist

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